

WHAT IS CLAIMED IS:

1. A digital image processing method for aligning in vivo images from multiple passes of a gastrointestinal tract to aid in diagnosing gastrointestinal disease, comprising the steps of:
 - a) conducting multiple passes of in vivo imaging within the gastrointestinal tract;
 - b) forming a registration bundle of metadata for each of the multiple passes;
 - c) selecting possible indexed features of an in vivo image from the registration bundle associated with one pass; and
 - d) retrieving corresponding images from another pass based on prior selection of the possible indexed features.
2. The digital image processing method claimed in claim 1, wherein forming a registration bundle of metadata, includes the steps of:
 - b1) retrieving an anatomical identity label associated with the gastrointestinal tract;
 - b2) retrieving a global index label corresponding to each in vivo imaging pass;
 - b3) retrieving a local index label with respect to a specific anatomical section within the gastrointestinal tract;
 - b4) calculating global travel distance within the gastrointestinal tract;
 - b5) forming at least one registration bundlette from information in steps b1-b4; and
 - b6) forming a registration bundle from the at least one registration bundlette, wherein the at least one registration bundlette includes at least a combination of the anatomical identity label, the global index label, the local index label, and the global travel distance.

3. The digital image processing method claimed in claim 1, wherein selection of the possible indexed features includes the step of selecting an in vivo image using a global index.

4. The digital image processing method claimed in claim 1, wherein selection of the possible indexed features includes the step of selecting an in vivo image by browsing a plurality of images.

5. The digital image processing method claimed in claim 1, wherein selection of the possible indexed features includes the step of selecting an in vivo image using an anatomical identity and a local index.

6. The digital image processing method claimed in claim 3, wherein retrieving corresponding images from another pass based on prior selection of the in vivo image using the global index further includes the steps of:

- d1) retrieving anatomical identity based on a global index;
- d2) computing a local travel distance using a global travel distance and the anatomical identity;
- d3) locating images corresponding to the anatomical identity; and
- d4) locating a set of images in a neighborhood of computed local travel distance.

7. The digital image processing method claimed in claim 4, wherein retrieving corresponding images from another pass based on prior selection of the possible indexed features further includes the steps of:

- d1) retrieving a global index;
- d2) retrieving anatomical identity based on the global index;
- d3) computing a local travel distance using a global travel distance and the anatomical identity;

- d4) locating images corresponding to the anatomical identity; and
- d5) locating a set of images in a neighborhood of computed local travel distance.

8. The digital image processing method claimed in claim 5, wherein retrieving corresponding image) from another pass based on prior selection of the possible indexed features further includes the steps of:

- d1) computing a local travel distance using a global travel distance and the anatomical identity;
- d2) locating images corresponding to the anatomical identity; and
- d3) locating a set of images in a neighborhood of computed local travel distance.

9. An in vivo imaging alignment and processing system, comprising:

- a) an image alignment processor for selecting and retrieving possible indexed features of a plurality of in vivo images from multiple image capturing passes, wherein the possible indexed features enable one to correctly align the plurality of in vivo images from multiple image capturing passes according to images captured at substantially similar positions in a gastrointestinal tract;
- b) a template source for detecting in vivo images that indicate a diseased gastrointestinal tract and sending the in vivo images to the image alignment processor;
- c) a display for displaying a plurality of aligned in vivo images;
- d) a means for transmitting the plurality of in vivo images;
- e) a means for storing metadata associated with the plurality of in vivo images;

- f) a means for communicating selected in vivo images across a network;
- g) a means for outputting the plurality of aligned in vivo images; and
- h) a user interactive means for inputting and/or controlling the metadata and/or the plurality of in vivo images.